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TEACHERS' PERCEPTION IN RELATION TO THE IMPLEMENTATION OF ENVIRONMENTAL EDUCATION AT ELEMENTARY SCHOOLS OF FOREST MARGIN AREA OF GUNUNG SALAK ENDAH

(*Persepsi Guru dalam Kaitannya dengan Implementasi Pendidikan Lingkungan di Sekolah Dasar di Sekitar Hutan Gunung Salak Endah*)

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ABSTRACT

Research and information on teachers' perception of environment and environmental education (EE) in Indonesian context were insufficient. Therefore, this research aimed at identifying teachers' perception of environment and EE, as well as the influencing factors. Results showed that: (1) Teachers from forest margin areas had limited environmental perception; (2) Most of them had positive perception on EE implementation; however they viewed their competence and self-efficacy as being low. (3) Differences in EE perception among teachers were influenced by their educational background, non formal education, level of teaching difficulties from the grade they taught, and organizational experiences.

Keywords: teacher, perception, environmental education, elementary school, forest margin area, Gunung Salak Endah

INTRODUCTION

The Indonesian government had seen Environmental Education (EE) as a way to overcome environmental problems, including forest-related problems, by equipping human resources with capability to well manage the environment. Through its Ministry of Environment (MOE), the Indonesian government had encouraged the implementation of EE through formal education in schools. Schools located at forest margin areas had the potential to prepare their human resources with competence and motivation to actively participate in forest conservation. Short distance to forest areas enables teachers to take their students in direct interaction with the forest in their teaching-learning activities. Such interaction would fulfil students' curiosity, increase their sensitivity to the forest, and nourish their motivation to learn about forest and its related problems, thus increasing their motivation to participate in forest conservation efforts.

The government had commenced tuition-free school program for elementary schools, which open a wider access to education for children from low-income family, enabling more children to obtain basic education, thus making elementary level education as a strategic level in implementing EE. The Erikson life span development theory stated that children at elementary school age level have high initiative, imagination, and curiosity as well as high learning passion and task-accomplishment motivation; however, there are also potential for children at this age to develop feelings of inferiority, unproductive and incompetence (Santrock, 2008). Teachers of elementary schools play important roles in developing children's positive potentials, and keeping them from developing the negative potentials.

EE implementation at schools in Indonesia generally has yet to reach its optimum, both from the perspectives of educational objectives domain and teaching practices. Teachers generally felt that facilities limitation as the obstacles in EE implementation. However, several researches showed that teachers' perception influenced their teaching practices and participation in a program. Desjean-Perrotta *et al.* (2008) states that pre-service teachers' conception of environment will affect their teaching on environmental subjects. Furthermore, Smith-Sebasto (2007) states that teachers' participation in a residential EE program is influenced by their perceptions that the program has positive effects on their students. Teachers at forest margin area schools should have positive perceptions of both environment and EE to encourage them in practicing instructional methods which provide their students with opportunities to directly interact with forest, fulfil their students' interest and curiosity, and keep their learning passion; which would led to effective teaching-learning activities.

Research on teachers' perceptions of environment and EE, particularly in forest margin areas, were insufficient. Yet, such information would provide significant consideration in deciding the necessary professional development for teachers to be able to teach EE effectively which in turn would improve the EE implementation at schools. This research aimed at

identifying teachers' perceptions in relation to EE implementation at elementary schools in forest margin areas, comprised of identification on teachers' perception of the environment, teachers' perception of EE implementation, and the influencing factors on teachers' perception.

THEORETICAL FRAMEWORK

Teachers play important roles in shaping their students knowledge, attitudes and skills. Teacher is the one who translated educational philosophy and objectives into knowledge and skills, and transfer them to the students (Ofoegbu, 2004). Santrock (2008) suggests that a competent teacher should: be reliable, show initiative, become a role model for their students, and has motivation to give a meaningful contribution for the next generation.

In relation to EE, being a role model meant performing pro-environmental behaviour that their students would see and copy from them. Interview with four EE classroom teachers revealed that they have developed their environmental sensitivity from their direct experiences with the environment (Volk, 2003). Environmental sensitivity is a tendency to take interest in learning about, having concern for, and conducting measures for conserving the environment (Chawla, 1998). Having the environmental sensitivity means that the teacher would tend to perform responsible behaviour toward the environment, and therefore would served as a good role model for their students. Close distance to forest enabled teachers to provide hands on experiences for their students which would help them developed their pro-environmental attitude. Farmer *et al.* (2007) finds that elementary school students who joined environmental education field trip to Great Smoky Mountains National Park show retention of long-term knowledge and pro-environmental attitude.

Desjean-Perotta *et al.* (2008) suggest that teachers transmit their perceptions to their students, thus their environmental perception become essential for identification. Environmental perception is not only reflecting the scale and relation of an event and individual, but also various motives implied in their attitude toward the environment (Heathcote, 1980). Environmental perception also identified as a mental model or description individuals have about the environment which is used to give meanings to various events happened around them (Moseley & Desjean-Perrotta, 2010). Therefore, identifying teachers' perception of the environment was conducted through their mental model of the environment.

Teachers' perception on EE implementation is said to influence their participation in EE program. Research by Smith-sebasto (2007) shows that teachers' participation in a residential EE program at New Jersey School of Conservation are influenced by their perceptions that EE should be integrated into their students' academic preparation because of its positive influence. Robbins (2005) explains that motive/ motivation and attitudes are part of individual factor which influence perception. Therefore, teacher perception of EE implementation was identified through their motivation and attitude toward EE implementation.

Teachers' motivation naturally related to their attitude toward their job, which were the desire to participate in pedagogic (learning) processes in the school, and their interest/attention toward students' discipline and control in class that served as the basis of their involvement in academic and non-academic activities at school (Ofoegbu 2004). Ryan & Deci (2000) in *Self-Determination Theory* (SDT) differentiate various types of motivation based on the reason or end target which caused an action performed, which are amotivation, extrinsic motivation and intrinsic motivation, which falls along a continuum of higher self-determination. Vallerand, *et al.* (2008) suggest that the most self-determined types of motivation (intrinsic motivation) would lead to the most positive outcome. Therefore, teacher motivation towards EE implementation was measured from teacher intrinsic motivation, using an adaptation of Ryan's Intrinsic Motivation Inventory (IMI) scale (1992), which included 6 variables: interest/enjoyment, perceived choice, pressure tension, perceived competence, effort/ importance and value/usefulness

Teachers' attitude towards EE was measured through their self-efficacy and outcome expectancy toward EE (Sia 1992; Moseley *et al.* 2002; Moseley & Utley 2008). Sia (1992) has developed an instrument to measure teachers' attitude toward EE based on the two attitude measurements, *i.e*. self-efficacy and outcome expectancy, called the Environmental Education Efficacy Beliefs Instruments (EEEBI). This research used an adaptation of EEEBI to measure the teachers' perception.

METHODS

This research took place at four purposively sampled schools located at forest margin areas of Gunung Salak Endah, Pamijahan Sub district, Bogor Regency, West Java Province, Indonesia, on February to April 2010. Four schools were purposively sampled based on their short distance ($\leq$ 2 km) to forest area. Respondents were teachers from sample schools with a total number of 31 teachers.

Teachers' perception of environment was measured using the Draw-An-Environment Test (DAET) and analyzed using DAET Rubric (DAET-R) developed by Moseley & Desjean-Perrotta (2010). Teachers' perception of EE implementation was measured based on their motivation and attitude. IMI scale (Ryan, 1982) and EEEBI (Sia, 1992) were used in this research. The instruments were adapted and adjusted to Indonesian context (language and culture). Adaptation included the responses used, and scoring for the negative and positive

statements of the pressure/tension scale. The adapted IMI scale consisted of 5 responses Likert type scale, rather than the original 7 responses Likert type scale. The negative and positive statements scoring in the pressure/tension variable of the IMI scale were reversed as an adjustment. Reliability and validity test of the adapted instruments had yet to be done. Therefore, the research still relied on the instruments' face validity.

In addition to descriptive statistic, a factor analyses was conducted to summarize the 6 motivation variables and 2 attitudes variables to obtain fewer factors/variants which would best describe teacher perception of EE implementation. Spearman correlation, Mann-Whitney test, and Kruskal-Wallis test were conducted to identify the influencing factors of teachers' perception on EE implementation.

RESULT AND DISCUSSION

Teachers' characteristics

Elementary school teachers in Indonesia usually supervised one grade class and taught almost all subjects in that grade, including: natural science; social science; Indonesian language; Mathematics; Arts, Culture and Crafts; *Pancasila* and Citizenship Education; and local content subject (usually subjects on local languages). Different teachers usually taught other subjects such as Religion, Sports, and English for all grade classes. Such condition also found at the sample school; one teacher for all subjects in a grade, while there were other teachers who were responsible for teaching religion, sport, and English for all grade classes.

There were slightly more than half of the teachers' from sampled schools fell in the age category ≤ 30 year-old. Based on sex, there were also slightly more than half who were female. Only approximately one third of the teachers held bachelor degree, while more than half were graduated from senior high school. Most of the teachers had ≤ 10 years of teaching experience. Most of the teachers also stated that they had previously taught EE, through environmental-related teaching materials that were integrated into their core subjects, or in extracurricular activities conducted in an organization called *Pramuka* (Boy Scout).

Approximately two third (68%) of the teachers had not had EE through their formal education. However, more than half had experienced nonformal EE from various activities, such as seminar, workshop, training, *Sayaga Tagana* Search and Rescue (SAR) organization, *karang taruna* (youth) organization, *pecinta alam* (PA) nature lovers club, planting and outdoor games activities, as well as activities related to the World Bank's Water Sanitation for Low Income Community (WSLIC) program. There were approximately one third who had joined organization thath focus its activities on nature, such as *Saka Wana Bakti* (SWB; a kind of boy scout organization which focus its action on forest), PA, Pramuka, and SAR; while the rest were lacking the experience of joining such organization.

Teachers' Perception of Environment

Teachers' perception of the environment was identified from their drawings and writings on environment. Moseley & Desjean-Perotta (2010) state, that individuals shaped their own cognitive or mental model based on their knowledge, ideas, and experiences, in their effort to give meanings to and explain the events happened around them. Almost all of the teachers' drawings contained pictures of mountain scenery; apart from pictures of forest, school, and settlement settings. Mountain and forest were seen on a daily basis, both in their home and school, that the views had shaped their mental model of the environment.

Analyses of the drawings indicated that there were only two drawings which reflected the teachers' understanding of environmental interaction concept, and there were only three drawings showing human. Based on the number of environmental component drawn, two drawings showed all four of the environmental components; while more than two third of the drawings showed only three environment components. Based on the environmental concept used in the DAET-R, most of the drawings that were made suggested that teachers had limited or incomplete mental model of the environment. Most of the drawings seemed to place human outside the environment. Apparently, when they were asked to draw an environment, teachers saw the environment as something outside themselves, positioning themselves as an observant seeing the outside condition. Other reason seemed to be that the teachers were lacking the capacity to express their thoughts and ideas or perceptions in the form of drawings. This conclusion was drawn based on the teachers' comments that they could not draw, when they were asked to make drawings. Consequently, teachers' scores from the drawings were mostly low. The average score was 3 of the total highest possible score of 12. There were only two drawings which scored 5 – 8, which showed teachers' understanding of the concept of interaction in the environment.

A difference was shown in the environmental definition written by the teachers. Human was written in 14 definitions of environment, of which 6 mentioned human and interdependence with the surrounding environment without mentioning any specific environment components. Almost a half of the definitions written were vague; environmental component were unidentifiable in those definitions. A large number of vague writings led to an assumption that the teachers might not have the understanding of the environment. However, comparing the writings to the drawings had led to a deduction that most of the teachers were also lacking the capacity to express their ideas in writings. This condition should alert us that there might be something wrong in the education system. Indeed, the Indonesian education system still

focussed more on knowledge and hard skills development/ improvement, and seemed to overlooked students' soft-skills development, such as motivation and creativity.

Teachers' perception of EE implementation

Factor analyses on the motivation and attitudes variables showed that the variables were grouped into 3 new factors/variants. Four variables, *i.e*. perceived competence, pressure/tension, perceived choice, and self-efficacy, were clustered in factor 1, hereinafter referred to as EE teaching effectiveness. Three variables, *i.e*. interest/enjoyment, effort/importance, and value/ usefulness, were clustered in factor 2; hereinafter referred to as EE values. There was only one variable in factor 3, which was the outcome expectancy variable; hereinafter referred to as the EE outcome expectancy.

Teacher's perception of EE teaching effectiveness and its influencing factors

Teachers had positive perception of EE teaching effectiveness with mean score of 3.3 out of the total possible score of 5. Teachers did not see EE as a pressure or tension for them (mean score of 3.9 in pressure/tension), they felt that they had choices in teaching EE (mean score of 3.2 in perceived choice), and they thought that effective EE would lead to high students' responses (mean score of 3.7 in self-efficacy). Implementation of EE at the elementary schools had not been formalized into a standard curriculum. The absence of standard curriculum means there were no obligation or requirement to meet a targeted curriculum; the fact that had contributed to teachers' positive perception of EE. However, teachers perceived their competence of teaching EE as being low (mean score of 2.7 in perceived competence). In addition, teachers had the perception that they have low self-efficacy in their ability to conduct an effective monitoring, to explain the relevance of method and subjects taught to their students, and to master the required skills to teach effective EE (self-efficacy items related to competence in teaching EE).

This low perception of competence might have its root on teachers' educational background. This was supported by the result of spearman *correlation* analyses, which showed that educational background correlated with teachers' perception of EE teaching effectiveness with correlation coefficient of 0.441 (α 0.05). There were moderate correlation between educational background and teachers' perception of EE teaching effectiveness. The fact was, only a third of the teachers hold bachelor degree, while most of them only graduated from senior high school. Improvement on teachers' educational experiences should be able to improve their perceptions of EE teaching effectiveness, since education would provide them with teaching ability and skills.

Kruskal-Wallis test showed there were perception differences among teachers with different formal EE experience. Teachers who claimed to have experienced formal EE in university had the highest mean score of perception of 3.75. This fact supported the deduction already made that teachers' perception of EE teaching effectiveness were influenced by their educational background, particularly the EE experiences.

Teachers' perception of EE value and its influencing factors

Teachers' have positive perception on EE values for themselves, their students, and the environment (mean score of 4.3 on EE values, while the highest possible score was 5). Positive perceptions were reflected from their agreement to the statements related to interest toward EE, willingness to put effort and energy into their EE teaching, positive views on EE value/usefulness. Positive perceptions scored high as teachers got all three variables which construct the EE values: interest/ enjoyment (mean score of 4.3), effort/importance (mean score of 4.1), and value/usefulness (mean score of 4.4). Kruskal-Wallis test showed there were perception differences among teachers who taught different grade classes (α 0.1), teachers with different non formal EE experiences (α 0.01), and teachers with different organizational experiences (α 0.1).

Grade classes were grouped into three categories, *i.e*. lower grade (grade 1 – 3), higher grade (grade 4 – 6), and both grades (grade 1 – 6). Teachers who taught both grade classes had the highest mean score of perception. Differences might result from the level of teaching difficulties and different students' responses. Lemke (1994) as cited in Hardre & Sullivan (2008) suggests that the class' grade teacher taught would influence the effort and investment teachers put forth in their teaching practices, since teacher would be able to teach a narrow or wide range of subjects and students. Teacher who taught both lower and higher grade classes had the opportunity to teach with a wide range of teaching difficulties level which provided them with more diverse experiences in facing students with various development stages. Therefore, teachers could acquired more benefit from teaching EE for their professional development and could gained more real positive responses from the students from the higher grade classes.

There were also perception differences among teachers with non formal EE activities experiences. Various non formal EE activities would offer teachers the opportunity to interact directly with their environment. Activities such as planting and outdoor games had proved to result in teachers achieving the highest mean score of perception as compared to the other non formal EE activities.

Other variable that influenced teacher perception of EE values was teachers' experience in organization with environment/nature-focused activities. Teachers with experience in Pramuka had the highest mean score of perception. Pramuka activities provided teachers with outdoor experiences that directly interact with

environment, improving their sensitivity toward the environment. Direct interaction also opened teachers' insights on the values of EE, both for themselves, their students, and the environment.

Teachers' perception of EE teaching outcome expectancy and its influencing factors

The outcome expectancy variable built teachers' perception of EE teaching outcome expectancy (ETOE). Teachers had high mean score of perception on this variable (mean score of 3.9). Teachers believed that effective EE would result in positive students' responses. However, teachers believed that students' low outcome was not fully the responsibility of teacher or ineffective EE teaching; which implied that teachers believed there were other factors causing students' low learning outcome in EE. Statistical analyses using Spearman correlation, Kruskal-Wallis test and Mann-Whitney test did not showed any statistically significant values on each variables being tested. Therefore, factors which influenced teachers' perception of EE teaching outcome expectancy could not be determined.

Effort to Improve Teachers' Perception

The objective of EE is to develop human resources with awareness, knowledge, attitude and skills, as well as participation in solving environmental problems and preventing the emergence of new problems. Desjean-Perrotta *et al.* (2008) suggest that the way teachers taught EE could gave positive or negative influences to their students' behaviour toward the environment. Darner (2009) summarized various literatures that EE could succeed in improving students' will/motivation to perform pro-environmental behaviour when they were involved as active participants in EE teaching-learning activities. Pro-environmental behaviour in relation to forest conservation would enhance participation in forest conservation measures. Therefore, teachers from forest margin area schools should applied teaching strategies which could support the ability of students to obtain effective EE learning, a student-centred-learning (SCL) approach, and thus developing students' with ability and motivation to participate in forest conservation effort. Teachers' intrinsic motivation or autonomous extrinsic motivation and positive attitude toward EE, meaning teachers' positive perception of EE, would enable them to apply the SCL approach and assist them in obtaining effective EE teaching.

Teachers from forest margin area schools already had positive perceptions on EE implementation. However, they had low perceived competence and self-efficacy in teaching EE, and limited environmental perception. While teachers should have positive/high perception on their competence in implementing effective EE to be able to realize it in to a more student-centred teaching strategies, involving students as active participants in EE teaching-learning activities at schools. In forest margin area elementary schools, effective EE teaching (meaning choosing site-specific environmental-related subjects and the required teaching strategies) would improve students' knowledge and skills related to various forest and conservation problems, as well as instilling positive attitude toward forest conservation, and motivation to actively participate in various forest conservation measures in line with their development stages.

As a consequence of teachers' low perception of their competence in EE, its implementation had yet reached its optimum. Teachers should be provided with the opportunity to improve their competence in teaching EE and thus improving their perception. The combination of positive perception of EE, limited perception of environment and low perception on competence in teaching EE had further emphasized teachers' need to improve their perception. Improvement on teachers' perception could be done through various formal and non formal EE activities.

North American Association for Environmental Education (NAAEE, 2004) suggest that environmental educators should have environmental literacy, master the foundation of EE, understand professional responsibility of an environmental educator, able to plan and implement EE, foster learning, as well as have the knowledge, capability and commitment to conduct assessment and evaluation. Kenney *et al.* (2003) describe several key elements to be considered in planning effective EE activities for teachers which would enable them to apply the result on their students at schools, which were:

1. Teachers' education should be specifically designed considering local characteristics and environmental issues, and should be able to meet the standard school curriculum and EE.
2. Subjects given should cover environmental-related subjects and effective instructional practices, including how to teach in outdoor setting. Teachers should be provided with strategies to teach in outdoor setting, such as how to control students' behaviour, transition between activities, and to be flexible and creative at the ever-changing outdoor set.
3. The on-the-job training model had proven to be effective in building teachers' confidence to implement EE teaching. This model enable teachers to study effective EE teaching strategies by observing experienced instructors and take over the teaching practices under supervision of the instructors. This way, teachers would not have to leave their classes, spend long time after school, or use their planning time at home, to join the training; and the administrative staff would not have to find substitutes for the teachers while they were joining the training.
4. Before teachers followed the observation and teaching practices activities, they should be

introduced to the subjects and provided opportunity to discuss related processes (for example, how to help students find an exploration place outside their class) through a workshop.

5. Teachers should be familiarized with school environment and their surrounding environment by taking them in periodic short walk guided by experienced instructors.

Therefore, teachers' capacity/competence development should be aimed not only at improving their understanding and capacity on environmental-related subjects, but also the appropriate instructional method to deliver the subjects to students from different grades. Teachers should also be encouraged to directly interact with the environment more frequently to improve their experiences and sensitivities toward the environment. Consequently, capacity/competence development would improve teachers' perceptions of competence in teaching EE; which would enable them to apply effective EE teaching strategies. Thus, EE would enhance the development of human resources with both capacity and motivation to participate in forest conservation measures and performed their motivation into real actions.

SUMMARY

Results showed that teachers from forest margin area schools had limited environmental perception. They had positive perception of EE implementation viewed from three factors of perception, which are EE teaching effectiveness, EE values, and EE teaching outcome expectancy. However, they perceived their competence and (competence-related items) self-efficacy in teaching EE as being low. Consequently, EE implementation at schools has yet reach its optimum. The statistical analyses showed that differences in teachers' perceptions were influenced by their educational background, non formal EE experience, grades they taught (related to level of teaching difficulties), and nature-focused organizational experience.

The results suggested that teachers needed the means to improve their perception of competence and self-efficacy in teaching EE. Perception improvement could be done through various EE activities, both formal and non formal EE. The EE activities for teachers should aimed at improving teachers' knowledge on environmental-related subjects, particularly forest and its conservation for schools at forest margin areas, and their attitude and skills required to conduct pro-environmental behaviour and conservation measures. Teachers should also be provided with effective EE instructional methods to transfer the knowledge, attitude and skills to their students. Teachers should also be provided with opportunities to directly interact with their environment, in this case particularly the forest, to improve their sensitivity toward the environment/forest and its related problems. Improvement on teachers' perception would enable them to apply effective EE teaching strategies, to obtain EE objectives, and thus to develop human resources with capacity as well as motivation and real participation in conservation measures.

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